



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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Ms. Jolanta Wojas
General Electric Aviation
1000 Western Avenue
Lynn, Massachusetts 01910

RE: **LYNN – Metropolitan**
Boston/ Northeast Region
310 CMR 7.19
Application No. MBR-94-COM-008
Transmittal No. X235617
MODIFIED EMISSION CONTROL PLAN
FINAL APPROVAL

Dear Ms. Wojas:

The Metropolitan Boston/Northeast Region of the Department of Environmental Protection, Bureau of Waste Prevention, (“MassDEP”), is hereby responding to your written request, received on December 13, 2010, to modify your Oxides of Nitrogen (NO_x) Reasonably Available Control Technology (RACT) EMISSION CONTROL PLAN (ECP) FINAL APPROVAL issued to you by MassDEP on March 30, 2000. This NO_x RACT application was submitted by General Electric Aviation (GEA) and signed by Ms. Maria Deacon, as the legally responsible company official.

This review of the submitted information by MassDEP engineers indicates that GEA has requested that MassDEP cap the existing Babcock & Wilcox Model No. PPL-2897 Unit’s (Boiler No. 3) NO_x and Sulfur Dioxide (SO₂) emissions each to less than 250 tons per year. Boiler No. 3 will then be exempt from Best Available Control Retrofit Technology (BART) requirements. See Table 2 Emission Caps below.

PROCESS DESCRIPTION

The GEA facility located at 1000 Western Avenue in Lynn, Massachusetts consists of four (4) boilers, a stationary combustion turbine with its associated heat recovery steam generator (HRSG). One of the four boilers (Boiler No. 5) is not subject to NO_x RACT Regulation 310 CMR 7.19. Boiler No. 5 is addressed in 310 CMR 7.02 FINAL APPROVAL letter (MBR-97-COM-016). The three NO_x RACT subject boilers (Boiler Nos. 1, 2 and 3) are each capable of utilizing either natural gas as the primary fuel or No. 6 residual fuel oil as the secondary fuel. The No. 6 residual fuel oil shall have a maximum sulfur content of 1.0% by weight (1% S). The combustion turbine/HRSG (Unit No. 8) utilizes No. 2 distillate fuel oil as the primary fuel of use and natural gas as the secondary fuel use. The No. 2 distillate fuel oil shall have a maximum sulfur content of 0.3 percent by weight (0.3%). The NO_x RACT subject combustion units are described in Table 1 below.

Table 1 – Description of Subject NO_x RACT Combustion Sources

Unit No.	Description of Unit	Manufacturer & Model No.	Maximum Energy Input Rating (MMBtu/hr)*
1	Water tube boiler	Foster Wheeler 8B-1652	198.8
2	Water tube boiler	Foster Wheeler B-4482	195.0
3	Water tube boiler	Babcock & Wilcox PPL-2897	382.8
4	Combustion gas turbine/HRSG	General Electric G5301	270.0

* MMBtu/hr = million British Thermal Units per hour

Table 2 - UNIT NO. 3 NO_x AND SO₂ EMISSION CAPS

AIR POLLUTANT	Monthly Emissions (in tons)	12-Month Rolling Emissions (in tons)
NO _x	50.0	249.0
SO ₂	60.0	249.0

RACT STRATEGY FOR THE FOUR UNITS

Unit No. 1, the Foster Wheeler Model 8B-1652 boiler, has been adjusted to comply with the RACT emission limit of 0.3 pounds of NO_x per MMBtu (lbs NO_x/MMBtu) while firing either residual fuel oil (1.0% S) or residual fuel oil (1.0% S) and natural gas. The adjustments were the replacement of the burner tips and a redesigned swirler.

Unit No. 2, the Foster Wheeler Model B-4482 boiler, has been adjusted to comply with the RACT emission limit of 0.3 lbs NO_x/MMBtu while firing either residual fuel oil (1.0% S) or residual fuel oil (1.0% S) and natural gas. The adjustments were the replacement of the burner tips and a redesigned swirler.

Unit No. 3, the Babcock & Wilcox Model PPL-2897 boiler, has been adjusted to comply with the RACT emission limit of 0.28 pounds of NO_x per MMBtu (lbs NO_x/MMBtu) while firing either residual fuel oil (1.0% S) or residual fuel oil (1.0% S) and natural gas. The adjustments included the addition of the flue gas recirculation, stage air combustion and modifications to the flames stabilizer/gas spuds and oil atomizers.

Unit No. 8, the General Electric Model G5301 combustion gas turbine with associated HRSG, has incorporated steam injection controls. The steam injection control is based on fuel flow to the turbine. Steam injection will reduce the NO_x emission rate to 42 parts per million volume dry (ppmvd) on natural gas and 65 ppmvd on distillate fuel oil (0.3%), both corrected to 15% O₂ which are the RACT limits (310 CMR 7.19 (7)) for combined cycle stationary combustion turbines.

MassDEP has determined that the subject ECP modified application is administratively complete and that it is in conformance with current air pollution control engineering practice. Therefore, MassDEP hereby grants this **MODIFIED FINAL APPROVAL** for the subject modified ECP application, as submitted, with the following provisions:

I. NO_x EMISSION LIMITATIONS

1. That Unit Nos. 1 and 2 shall each comply with the RACT emission limit of 0.3 lbs NO_x/MMBtu while firing either residual fuel oil (1.0% S) or residual fuel oil (1.0% S) and natural gas.
2. That Unit No. 3 shall comply with the RACT emission limit of 0.28 lbs NO_x/MMBtu while firing either residual fuel oil (1.0% S) or residual fuel oil (1.0% S) and natural gas.
3. That Unit No. 8, shall not exceed the NO_x emission rate to 42 ppmvd while firing natural gas and 65 ppmvd while firing distillate fuel oil (0.3%), both corrective to 15% O₂ which are the RACT limits (310 CMR 7.19 (7)) for combined cycle stationary combustion turbines.
4. These emission limits shall not apply during periods of startup, shutdown, and other exclusion periods as specified in the MassDEP approved Standard Operating Plan.

II. CARBON MONOXIDE (CO) EMISSION LIMITATIONS

1. That Unit Nos. 1, 2 and 3 shall not exceed a CO exhaust concentration of 200 ppmvd, corrected to 3% O₂, while firing either usage will fuel oil (1.0% S) or residual fuel oil (1.0% S.) and natural gas.
2. That Unit No. 8, shall not exceed the CO emission rate to 50 ppmvd, corrective to 15% O₂ while firing distillate fuel oil (0.3%) or distillate fuel oil (0.3%) and natural gas which is the RACT limit (310 CMR 7.19 (7)) for combined cycle stationary combustion turbines.
3. These emission limits shall not apply during periods of startup, shutdown, and other exclusion periods as specified in the MassDEP approved Standard Operating Plan.

III. UNIT NO. 3 NO_x AND SO₂ EMISSION CAPS

1. Unit No. 3 shall comply with the Emission Caps contained in Table 2 above.

IV. TESTING AND MONITORING REQUIREMENTS

1. That Unit Nos. 1, 2 and 3 shall demonstrate compliance with the above CO and NO_x emission standards by the use of a continuous emissions monitoring system (CEMS) for each unit. All CEMS shall comply with regulation 310 CMR 7.19(13)(b). For Unit No. 8, CEMS monitoring shall be supplemented by parametric monitoring as specified in the MassDEP approved Standard Operating Plan for periods when the unit emits through the bypass stack.

2. GEA shall follow the operating, monitoring, testing and emergency procedures for Unit Nos. 1, 2, 3, and 8 as described in the MassDEP approved Amendments to Standard Operating Plan for Powerhouse Combustion Units Document dated September 2001.

V. RECORD KEEPING AND REPORTING REQUIREMENTS

1. GEA shall demonstrate compliance status with regulation 310 CMR 7.19(13)(d) with adequate recordkeeping and reporting. These requirements include the following items:
 - a. GEA shall maintain a record of all measurements, performance evaluations, calibration checks, and maintenance on adjustments for each CEM;
 - b. GEA shall submit to the MassDEP's Northeast Regional Office (NERO), attention Permit Chief for the Bureau of Waste Prevention, by the 30th day of April, July, October, and January of each calendar year, a report showing any excess emissions as measured by a CEMS within the previous calendar quarter (January-March, April-June, July-September, and October-December) and shall include:
 - 1) The date and time of commencement and completion of each period of excess emissions and the magnitude of the excess emissions for each hour;
 - 2) Identification of the suspected reason for the excess emissions in any corrective action taken;
 - 3) The date and time that any CEMS stopped collecting valid data and when it started to collect valid data again, except for zero and span checks; and
 - 4) The nature and date of system repairs;

In the event none of the above items have occurred such information shall be stated in the report;

- c. GEA shall measure and record for each unit on a daily basis: type fuel(s) burned each day, the content of each fuel (measured heat content values from the fuel supplier), the total heating value of the fuel consumed for each day, the actual NO_x and CO emission rates (for emission units demonstrating compliance with CEMS), and the allowable NO_x and CO emission rates;
- d. GEA shall obtain certification from the fuel oil supplier for each new shipment of residual oil fuel that includes the following information: 1) the name of the oil supplier; 2) the nitrogen content of each oil shipment (acceptable test methods for determining nitrogen content of the fuel oil are ASTM methods D3228 and D4629 or any other method approved by MassDEP and EPA); 3) the location where the sample was drawn for analysis to determine the nitrogen content of the oil, specifically including whether the fuel oil was sampled as delivered to the affected facility or whether the sample was drawn from fuel oil in storage at the oil supplier's or oil refiner's facility or another a location.

Alternatively, GEA may elect to sample and analyze the residual fuel oil immediately after the fuel tank is filled and before any oil is combusted for each new shipment according to methods approved by MassDEP;

e. GEA shall maintain all daily records and fuel supplier certification or fuel oil analysis reports on site for period of five years. The records shall be permit the bound in a logbook or any other form acceptable to the MassDEP including computer retained in generated data. All compliance records shall be submitted within 10 days of the request by the MassDEP or EPA. Said records and reports shall be made available to the MassDEP or EPA personnel upon request.

f. That GEA shall maintain adequate records, which shall be kept at its facility located at 1000 Western Avenue, Lynn, Massachusetts. These records shall contain, at a minimum, all data necessary to demonstrate compliance with the requirements delineated in this ECP approval letter. These records shall be maintained at the Central Utility Plant of GEA for a minimum period of five years, and shall be made available to MassDEP personnel upon request.

2. GEA shall demonstrate compliance with Table 2 NO_x and SO₂ emission caps by tracking emissions using the following formulas:

a) Tons of SO₂emitted = [0.0006 lbs. SO₂ /Mcf of NG x Mcf of NG + (0.157 x wt% S) lbs./gal x gal #6 fuel oil]/ 2000 lbs./ton

b) Tons of NO_x emitted = [NO_x lbs. (NG) + NO_x lbs. (#6 fuel oil)]/2000 lbs. /ton

c) NO_x lbs. (NG) = 1.194 x 10⁻⁷ (lb/dscf)/ppmvd x 8710 dscf/MMBtu x NO_x ppmvd x 20.9/(20.9-O_{2d}%) x Measured Fuel Heat Content (MMBtu/100scf) x Fuel Flow Rate (100 scfh) x hours of NG firing

d) NO_x lbs. (#6 fuel oil) = 1.194 x 10⁻⁷ (lb/dscf)/ppmvd x 9190 dscf/MMBtu x NO_x ppmvd x 20.9/(20.9-O_{2d}%) x Measured Fuel Heat Content (MMBtu/100gal) x Fuel Flow Rate (gal/hr) x hours of #6 fuel oil firing

Where: lbs. = pounds
Mcf = thousand cubic feet
NG = natural gas
wt% = weight percent
S = Sulfur
gal = gallon(s)
ppmvd = parts per million measured on a dry basis
O_{2d}% = oxygen in percent measured on a dry basis
MMBtu = million British Thermal Units
dscf = dry standard cubic feet
scf = standard cubic feet
scfh = standard cubic feet per hour
Hr. = Hour

Note: The NO_x ppmvd data shall be taken from Continuous Emission Monitoring System (CEMS) which GEA use 40 CFR 75 monitoring procedures. For any hour that valid measurement data is missing, Boiler No. 3 NO_x emission rate substitution values shall be determined in accordance with 40 CFR 75 procedures.

3. GEA shall maintain NO_x and SO₂ emission records for Unit No. 3 at the Central Utility Plant of GEA for a minimum of five years and shall make them available to MassDEP personnel upon request.

4. GEA shall report Unit No. 3 monthly and rolling 12-month NO_x and SO₂ emissions in the quarterly reports that are submitted per Approval MBR-97-COM-016.

V. GENERAL REQUIREMENTS/PROVISIONS

1. This Modified Final Approval dated March 24, 2011, shall supersede the previous Modified Emission Control Plan Approval dated March 18, 2011, the Emission Control Plan Final Approval, dated March 30, 2000 and Modified Emission Control Plan Final Approval, dated November 28, 2001.
2. GEA shall maintain continuous compliance at all times with the terms of this ECP.
3. This approval may be suspended, modified, or revoked by MassDEP if at any time the facility is violating any applicable regulation(s) or condition(s) of this approval letter.
4. The subject ECP consist of the application materials and this approval letter if conflicting information is found between these two documents then the requirements of the approval letter shall take precedence over the documentation in the application materials.
5. That should any nuisance condition(s) occur as a result of the operation of these units, then GEA shall immediately take appropriate steps to abate said nuisance condition(s).
6. That GEA shall maintain on-site, at all times, a copy of the Standard Operating and Maintenance Procedure (SOMP) for the subject equipment.
7. MassDEP has determined that the filing of an Environmental Notification Form (ENF) with the Secretary of Energy and Environmental Affairs, for air quality control purposes, was not required prior to this action by MassDEP. Notwithstanding this determination, the Massachusetts Environmental Policy Act (MEPA) and Regulation 301 CMR 11.00 Section 11.04, provide certain “which allow the Secretary to require the filing of an ENF and/or Environmental Impact Report at a later time.
8. That this approval does not negate the responsibility of GEA to comply with this or any other applicable federal, state, or local regulations now or in the future. Nor does this approval imply compliance with any other applicable federal, state, or local regulations now or in the future.

Failure to comply with any of the above stated provisions will constitute a violation of the “Regulations”, and can result in the revocation of the approval granted herein.

VI. APPEAL PROCESS

This Modified Emission Control Plan Final Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this Approval.

Under 310 CMR 1.01 (6)(b), the request must state clearly and concisely the facts, which are the grounds for the request, and the relief sought. Additionally, the request must state why the plan approval is not consistent with the applicable laws and regulations.

The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100.00) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, Massachusetts 02211

The request will be dismissed if the filing fee is not paid unless the appellant is exempt or granted a waiver as described below.

The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

MassDEP may waive the adjudicatory hearing filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Should you have any questions concerning this matter, please do not hesitate to contact Mr. Marc Altobelli at (978) 661-7600.

Sincerely,

Marc Altobelli
Environmental Engineer
Bureau of Waste Prevention

James E. Belsky
Permitting Chief
Bureau of Waste Prevention

cc: Board of Health, 1 City Hall, Lynn, MA 01901
Fire Headquarters, 725 Western Avenue, Lynn, MA 01901
DEP, Boston, Attn: Yi Tian, AQ (e-copy)
DEP, NERO, Attn: M. Altobelli
U.S Environmental Protection Agency, Region 1, 5 Post Office Square, Suite 100, Mail Code OES04-2,
Boston, Massachusetts 02109-3912 ATTN: Section Chief, Stationary Source and Compliance Section